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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/413,177 10/07/99 CHAN

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EXAMINER	

MM71/0831

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POUGHKEEPSIE NY 12603

ART-UNIT	PAPER NUMBER
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DATE MAILED:

08/31/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/413,177

Applicant(s)

CHAN ET AL.

Examiner

Paul E Brock II

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,6 and 8-18 is/are rejected.
- 7) ☒ Claim(s) 3,4 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 October 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 14 is objected to because of the following informalities: The passage “comprising transistors said transistors being...” makes little sense and should be written to say “comprising transistors being”. Further, “and RF amplifier” should be “an RF amplifier”. Appropriate correction is required.
2. Claim 16 is objected to because of the following informalities: It appears that “being a” should be “being”. Appropriate correction is required.
3. Claim 17 is objected to because of the following informalities: It appears that “the polygonal of said inductor being a” should be “the polygonal inductor being a”. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Regarding claim 9, claiming that a disposable solid layer being a polymer is an improper shift of the applicants' invention. In claim 8 it was expected that the nitride and disposable solid are one in the same. Therefore, claim 9 is indefinite because there is no antecedent basis for “said disposable solid” being a polymer. Further, even though the nitride layer is being called a disposable solid in claim 8 does not make the disposable solid anything but nitride.
6. Regarding claims 11 and 12, the method steps that are stated herein are directed towards removal of a polymer, therefore the limitation of claim 8 is an inaccurate description of the

claimed invention, because while a nitride layer used as claimed can be called a disposable solid, it is still a nitride layer.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 2, 5, 6, 8, 10 and 14 - 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lur et al. in view of Chu et al.

Lur et al. discloses a method of forming air gaps within an integrated circuit structure in figures 1 – 11.

With regard to claim 1, Lur et al. discloses in figure 1 providing a partially fabricated integrated circuit structure and depositing a layer of dielectric (30) thereon. Lur et al. discloses in figure 1 forming a metal layer (40) on the surface of the dielectric layer. Lur et al. discloses in figure 1 depositing a thin layer of oxide (42) over the surface of the dielectric layer thereby including the metal layer. Lur et al. discloses in figures 2 – 4 forming a structure for a first layer of cavities over the surface of the thin layer of oxide and aligned with the metal layer the forming a structure for a first layer of cavities comprising applying and patterning a first layer of nitride (34) followed by applying and patterning a first layer of oxide (42), the forming a structure for a first layer of cavities further comprising forming a first and a second opening through the first layer of oxide. Lur et al. discloses in figures 9 and 10 forming a structure for a second layer of

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cavities above and aligned with the structure for the first layer of cavities the forming a structure for a second layer of cavities comprising applying and patterning a second layer of nitride followed by applying and patterning a second layer of oxide, the forming a structure for a second layer of cavities further comprising forming a first and a second opening through the second layer of oxide. Lur et al. discloses in figure 11 creating the first and the second layer of cavities (85). Lur et al. discloses in figure 11 performing an oxide deposition over the surface of the second layer of cavities creating a thin layer of oxide (80). Lur et al. does not disclose forming a metal inductor on the surface of the thin layer of oxide. Chu et al. teaches in figure 5 forming a metal inductor (40) on a surface of a thin layer of oxide. It would have been obvious to one of ordinary skill in the art at the time of the present invention to form the metal inductor of Chu et al. on the thin oxide of Lur et al. in order to form air gaps underlying an inductor as stated by Chu et al. in column 3, lines 53 – 62.

With regard to claim 2, Lur et al. discloses in figure 1 the forming a metal layer on the surface of the dielectric layer is forming a layer of metal that has the cross section of a square or a rectangle with essentially vertical sides whereby the height of the metal layer is equal to the thickness of a conventional semiconductor metal layer whereby a width of the metal layer is equal to or exceeds its height by a measurable amount.

With regard to claim 5, Lur et al. discloses in figures 10 and 11 that the creating a first and a second layer of cavities is removing the first and second layer of nitride the removal to take place by accessing the first and second layer of nitride by means of the first and second opening created in the second layer of oxide furthermore by accessing the first layer of nitride by means of the first and second openings in the first layer of oxide.

With regard to claim 6, Lur et al. discloses in figures 10 and 11 that the performing an oxide deposition over the surface of the second layer of cavities is creating a thin layer of oxide over the surface of the second layer of oxide thereby furthermore closing off the first and the second openings created in the second layer of oxide.

With regard to claim 8, Lur et al. discloses in figures 10 and 11 the layers of nitride being layers of a disposable solid.

With regard to claim 10, Lur et al. discloses in column 3, lines 61 – 66 removing the disposable solid layer is introducing a solvent to the substrate dissolving the disposable solid layer.

With regard to claim 14, it is inherent that the partially fabricated integrated circuit structure of Lur et al. and Chu et al. comprising transistors being bipolar or CMOS and are interconnected to form an RF amplifier.

With regard to claims 15 and 16, Chu et al. teaches in column 3, lines 28 – 29 that the inductor is spiral shaped. It is inherent that the spiral shaped inductor of Chu et al. is a circular or polygonal shaped.

9. Claims 13, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lur et al. and Chu et al. as applied to claim 1 above, and further in view of Abidi et al.

With regard to claim 13, Lur et al. and Chu et al. do not disclose an insulating layer deposited over the surface of the inductor. Abidi et al. teaches in figures 6a – 6c depositing an insulating layer (20) over the surface of an inductor (76) thereby encapsulating the inductor. It would have been obvious to one of ordinary skill in the art at the time of the present invention to

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use the insulating layer of Abidi et al. to encapsulated the inductor of Lur et al. and Chu et al. in order to insulated the inductor from surroundings outside of the chip as is well known in the art.

With regard to claim 17, Lur et al. and Chu et al. do not disclose a polygonal shape of an inductor. Abidi et al. discloses in column 5, lines 44 – 50 a polygonal shape of an inductor is a square. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the spiral square inductor shape of Abidi et al. in the method of Lur et al. and Chu et al. in order to have an inductor of a shape that has properties which are well known in the art.

With regard to claim 18, Lur et al. and Chu et al. do not specify properties of the inductor. Abidi et al. discloses in column 7, lines 34 – 37 an inductor having an inductance in excess of 1 nh and a self-resonance in excess of 10 MHz. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use an inductor with the disclosed properties of Abidi et al. in the method of Lur et al. and Chu et al. in order to have an RF tuned amplifier that can be fabricate having a large value monolithic inductor thereby substantially increasing as stated by Abidi et al in column 7, lines 35 – 42.

Allowable Subject Matter

10. Claims 3, 4 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record either singularly or in combination fails to disclose at least the step of creating two openings in an oxide layer located at opposite extremities of the oxide layer which is overlying a nitride layer used for the purpose of forming cavities. The openings located at

opposite extremities of the oxide layer have a diameter that is less than the dimension of the thickness of the oxide layer.

Response to Arguments

12. Applicant's arguments filed 7-30-01 have been fully considered but they are not persuasive.

13. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

14. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., page 15, lines 18 – 20 “the instant invention provides oxide fins”, page 16, lines 15 and 16 “horizontal layers of a dielectric are created”, page 21, lines 21 – 23 “ horizontal air gaps that are interspersed with layers of dielectric”) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

15. In response to applicant's argument that “the instant invention is silent on these aspect of the Lur et al. invention and is not limited to a DRAM device or the use of gate electrodes.”, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use,

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then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

16. In response to applicant's argument that "Chu et al... does not make use of horizontal air cavities", the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

17. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E Brock II whose telephone number is (703)308-6236. The examiner can normally be reached on 8:30 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703)308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Paul E Brock II
August 29, 2001



Jerome Jackson, Jr.
Primary Examiner